REMARKS

Claims 1, 4, 13, 20 and 21 have been amended and new claims 22-28 have been added. In particular, claims 1, 13, 20 and 21 have been amended to recite that the liquid crystal dot matrix display cell, the digit liquid crystal display cell and the liquid crystal optical valve are a "twisted nematic liquid crystal dot matrix," a "digit twisted nematic liquid crystal display cell," and a "twisted nematic liquid crystal optical valve" as supported on page 10, lines 26-27, and on page 11, lines 34-37, of the specification as originally filed. Claims 1, 13, 20 and 21 have also been amended to improve punctuation and form to improve clarity. Claim 4 has been amended to improve grammar.

New claim 22 depends upon claim 1, and recites the embodiment "wherein the back polariser is crossed with the front polariser, the display cell and the optical valve both have positive anisotropy or both have negative anisotropy, and wherein the at least two switching states comprise: a first switching state wherein the display cell is switched OFF and the optical valve is switched OFF, and the first display device is hidden by a mirror mask; a second switching state wherein the display cell is switched ON and the optical valve is switched OFF so a portion of the first display device is seen through a transparent window and the display cell shows data in the dark shade on a light background; a third switching state wherein the display cell is switched OFF and the optical valve is switched ON so that only the first display device is seen; and a fourth switching state wherein the display cell is switched ON and the optical valve is switched ON so the first display device is seen and the display cell shows data in a light color on a dark background as supported on page 7, line 34, to page 8, line 34, and by Figures 6A through 6D of the application as originally filed.

New claim 23 depends upon claim 1 and recites the embodiment "wherein the back polariser is parallel to the front polariser, the display cell and the optical valve both have positive anisotropy or both have negative anisotropy, and wherein the at least two switching states comprise: a first switching state wherein the display cell is switched OFF and the optical valve is switched OFF

so that only the first display device is seen; a second switching state wherein the display cell is switched ON and the optical valve is switched OFF so the first display device is seen and the display cell shows data in a light color on a dark background; a third switching state wherein the display cell is switched OFF and the optical valve is switched ON, and the first display device is hidden by a mirror mask; and a fourth switching state wherein the display cell is switched ON and the optical valve is switched ON so a portion of the first display device is seen through a transparent window and the display cell shows data in the dark shade on a light background" as supported on page 9, lines 12-21, and Figures 7A through 7D of the application as originally filed.

New claim 24 depends upon claim 13 and recites the embodiment "wherein the back polariser is crossed with the front polariser, the display cell and the optical valve both have positive anisotropy or both have negative anisotropy, and wherein the at least two switching states comprise: a first switching state wherein the display cell is switched OFF and the optical valve is switched OFF, and the first display device is hidden by a black mask; a second switching state wherein the display cell is switched ON and the optical valve is switched OFF so a portion of the first display device is seen through a transparent window and the display cell shows data in the light shade on a dark background; a third switching state wherein the display cell is switched OFF and the optical valve is switched ON so that only the first display device is seen; and a fourth switching state wherein the display cell is switched ON and the optical valve is switched ON so the first display device is seen and the display cell shows data in a dark color on a light background" as supported on page 9, lines 22-36, and Figures 8A through 8D of the application as originally filed.

New claim 25 depends upon claim 13 and recited the embodiment "wherein the back polariser is parallel to the front polariser, the display cell and the optical valve both have positive anisotropy or both have negative anisotropy, and wherein the at least two switching states comprise: a first switching state wherein the display cell is switched OFF and the optical valve is switched OFF so that only the first display device is seen; a second switching state wherein the display cell is switched ON and the optical valve is switched OFF so the first display device is seen and the display cell shows data in a dark color on a light background; a third switching state wherein

the display cell is switched OFF and the optical valve is switched ON, and the first display device is hidden by a black mask; and a fourth switching state wherein the display cell is switched ON and the optical valve is switched ON so a portion of the first display device is seen through a transparent window and the display cell shows data in the light shade on a dark background" as supported on page 10, lines 1-10, and Figures 9A through 9D of the application as originally filed.

New claim 26 depends upon claim 1 and recited the embodiment "wherein the back polariser is crossed with the front polariser, the display cell has negative anisotropy and the optical valve has positive anisotropy, and wherein the at least two switching states comprise: a first switching state wherein the display cell is switched OFF and the optical valve is switched OFF so that only the first display device is seen; a second switching state wherein the display cell is switched ON and the optical valve is switched OFF so the first display device is seen and the display cell shows data in a light color on a dark background; a third switching state wherein the display cell is switched OFF and the optical valve is switched ON, and the first display device is hidden by a mirror mask; and a fourth switching state wherein the display cell is switched ON and the optical valve is switched ON so a portion of the first display device is seen through a transparent window and the display cell shows data in the dark shade on a light background" as supported on page 10, lines 24-37, and in Figures 10A through 10D of the application as originally filed.

New independent claim 27 incorporates the subject matter of previous claim 1, and is believed to have the same scope as previous claim 1. New independent claim 28 incorporates the subject matter of previous claim 13, and is believed to have the same scope as previous claim 13. In other words, these claims do not contain the "twisted nematic" limitation of amended claim 1.

The present amendment adds no new matter to the instant application.

The Invention

The present invention pertains broadly to a display assembly, such as would be used in a timepiece, having two superposed display devices for displaying information by inverting the contrast of all or part of the information displayed between the two display devices. Specifically,

in a first embodiment in accordance with the present invention, a display assembly with two superposed contrast inversion display devices is claimed, wherein the display assembly includes (a) a first display device; and (b) a second active display device having a double structure, one structure being formed by a first contrast inversion display device provided by a twisted nematic liquid crystal dot matrix display cell or by a digit twisted nematic liquid crystal display cell, the liquid crystals of the one structure being confined in a space delimited by two transparent substrates and having two switching states, and the other structure being formed by a second contrast inversion display device provided by a twisted nematic liquid crystal optical valve, the liquid crystals of the other structure being confined in a space delimited by two transparent substrates and having at least two switching states and control means allowing an appropriate voltage to be selectively applied to the display cell and optionally to all or part of the valve to cause each liquid crystal to switch from one state to another, wherein a first absorbent or reflective front polariser is arranged at the front of the display cell and in that a second back polariser, crossed with the front polariser or parallel thereto, is arranged at the back of the valve so that when the display cell is switched to display at least one item of data, the total or partial switching of the valve, from one state to another, inverts the contrast of the data displayed from a light appearance to a dark appearance or vice versa, wherein the first display device has a dark shade and the back polariser is a reflective polariser, and wherein the first contrast inversion display device and the second contrast inversion display device are superposed.

In accordance with a second embodiment of the invention, a display assembly with two superposed contrast inversion display devices is claimed wherein the display assembly includes (a) a first display device; and (b) a second active display device having a double structure, one structure being formed by a first contrast inversion display device provided by a liquid crystal dot matrix display cell or by a digit liquid crystal display cell, the liquid crystals of the one structure being confined in a space delimited by two transparent substrates and having two switching states, and the other structure being formed by a second contrast inversion display device provided by a liquid crystal optical valve, the liquid crystals of the other structure being confined in a space delimited by two transparent substrates and having at least two switching states and control means allowing an

appropriate voltage to be selectively applied to the display cell and optionally to all or part of the valve to cause each liquid crystal to switch from one state to another, wherein the second active display includes only two polarisers such that a first absorbent or reflective front polariser is arranged at the front of the display cell and in that a second back polariser, crossed with the front polariser or parallel thereto, is arranged at the back of the valve so that when the display cell is switched to display at least one item of data, the total or partial switching of the valve, from one state to another, inverts the contrast of the data displayed from a light appearance to a dark appearance or vice versa, wherein the first display device has a light shade and the back polariser is an absorbent polariser, and wherein the first contrast inversion display device and the second contrast inversion display device are superposed.

In accordance with a third embodiment of the invention, a display assembly with two superposed contrast inversion display devices is claimed wherein the display assembly includes (a) a first display device; and a second active display device having a double structure, one structure being formed by a first contrast inversion display device provided by a twisted nematic liquid crystal dot matrix display cell or by a digit twisted nematic liquid crystal display cell, the liquid crystals of the one structure being confined in a space delimited by two transparent substrates and having two switching states, and the other structure being formed by a second contrast inversion display device provided by a twisted nematic liquid crystal optical valve, the liquid crystals of the other structure being confined in a space delimited by two transparent substrates and having at least two switching states and control means allowing an appropriate voltage to be selectively applied to the display cell and optionally to all or part of the valve to cause each liquid crystal to switch from one state to another, wherein the second active display includes only two polarisers such that a first absorbent or reflective front polariser is arranged at the front of the display cell and in that a second back polariser, crossed with the front polariser or parallel thereto, is arranged at the back of the valve so that when the display cell is switched to display at least one item of data, the total or partial switching of the valve, from one state to another, inverts the contrast of the data displayed from a light appearance to a dark appearance or vice versa, wherein the first display device has a dark shade and

the back polariser is a reflective polariser, and wherein the first contrast inversion display device and the second contrast inversion display device are superposed, and the transparent substrates opposite the display cell and the valve are combined in a single transparent substrate.

In accordance with a fourth embodiment of the present invention, a display assembly with two superposed contrast inversion display devices is claimed wherein the display assembly includes (a) a first display device; and (b) a second active display device having a double structure, one structure being formed by a first contrast inversion display device provided by a liquid crystal dot matrix display cell or by a digit liquid crystal display cell, the liquid crystals of the one structure being confined in a space delimited by two transparent substrates and having two switching states, and the other structure being formed by a second contrast inversion display device provided by a liquid crystal optical valve, the liquid crystals of the other structure being confined in a space delimited by two transparent substrates and having at least two switching states and control means allowing an appropriate voltage to be selectively applied to the display cell and optionally to all or part of the valve to cause each liquid crystal to switch from one state to another, wherein a first absorbent or reflective front polariser is arranged at the front of the display cell and in that a second back polariser, crossed with the front polariser or parallel thereto, is arranged at the back of the valve so that when the display cell is switched to display at least one item of data, the total or partial switching of the valve, from one state to another, inverts the contrast of the data displayed from a light appearance to a dark appearance or vice versa, wherein the first display device has a light shade and the back polariser is an absorbent polariser, and wherein the first contrast inversion display device and the second contrast inversion display device are superposed, and the transparent substrates opposite the display cell and the valve are combined in a single transparent substrate.

In accordance with a fifth embodiment of the present invention, a display assembly with two superposed contrast inversion display devices is provided wherein the assembly includes: (a) a first display device; and (b) a second active display device having a double structure, one structure being formed by a first contrast inversion display device provided by a liquid crystal dot matrix display cell or by a digit liquid crystal display cell, the liquid crystals of the one structure

being confined in a space delimited by two transparent substrates and having two switching states, and the other structure being formed by a second contrast inversion display device provided by a liquid crystal optical valve, the liquid crystals of the other structure being confined in a space delimited by two transparent substrates and having at least two switching states and control means allowing an appropriate voltage to be selectively applied to the display cell and optionally to all or part of the valve to cause each liquid crystal to switch from one state to another, wherein the second active display includes only two polarisers such that a first absorbent or reflective front polariser is arranged at the front of the display cell and in that a second back polariser, crossed with the front polariser or parallel thereto, is arranged at the back of the valve so that when the display cell is switched to display at least one item of data, the total or partial switching of the valve, from one state to another, inverts the contrast of the data displayed from a light appearance to a dark appearance or vice versa, wherein the first display device has a dark shade and the back polariser is a reflective polariser, and wherein the first contrast inversion display device and the second contrast inversion display device are superposed.

In accordance with a sixth embodiment of the present invention, a display assembly with two superposed contrast inversion display devices is provided wherein the assembly includes: (a) a first display device; and (b) a second active display device having a double structure, one structure being formed by a first contrast inversion display device provided by a liquid crystal dot matrix display cell or by a digit liquid crystal display cell, the liquid crystals of the one structure being confined in a space delimited by two transparent substrates and having two switching states, and the other structure being formed by a second contrast inversion display device provided by a liquid crystal optical valve, the liquid crystals of the other structure being confined in a space delimited by two transparent substrates and having at least two switching states and control means allowing an appropriate voltage to be selectively applied to the display cell and optionally to all or part of the valve to cause each liquid crystal to switch from one state to another, wherein the second active display includes only two polarisers such that a first absorbent or reflective front polariser is arranged at the front of the display cell and in that a second back polariser, crossed with the front

polariser or parallel thereto, is arranged at the back of the valve so that when the display cell is switched to display at least one item of data, the total or partial switching of the valve, from one state to another, inverts the contrast of the data displayed from a light appearance to a dark appearance or vice versa, wherein the first display device has a light shade and the back polariser is an absorbent polariser, and wherein the first contrast inversion display device and the second contrast inversion display device are superposed.

Various other embodiments in accordance with the present invention are the subject of the dependant claims. One advantage of the embodiments in accordance with the present invention is that a display assembly, such as would be used in a timepiece, is provided that has two superposed display devices that display dark indicia on a light background or light indicia on a dark background thereby providing an aesthetically pleasing and easy to read information display of various data, such as time data and the like.

The Rejection

Claims 1, 4, 8, 10-13, 16, 18, 20 and 21 stand rejected under 35 U.S.C. 103(a) as unpatentable over "Applicant's admitted prior art" (hereafter abbreviated "AAPA," see Applicant's specification, page 1, line 16 to page 5, line 2; and Figure 1A) in view of Wang et al. (U.S. Patent5,726,723). Claims 2, 3, 9, 14, 15, 17 and 19 stand rejected under 35 U.S.C. 103(a) as unpatentable over Applicant's admitted prior art (AAPA) in view of the Wang Patent, and further in view of Masafumi et al. (EP 0930522).

Applicant respectfully traverses the rejection and requests reconsideration of the application for the following reasons.

Applicant's Arguments

The Examiner's rejections all invoke 35 U.S.C. § 103(a). The Supreme Court has ruled that a proper 103 analysis requires (a) determining the scope and content of the prior art, (b) ascertaining the differences between the prior art and the claims at issue, (c) resolving the level of

ordinary skill in the pertinent art, and (d) considering secondary factors in order to determine the obviousness or nonobviousness of the claimed subject matter. Graham v. John Deere Co. of Kansas City, 148 U.S.P.Q. 460, 467 (1966). When determining the scope and content of the prior art, the courts have required that prior art must be given a fair reading as a whole. In re Gordon, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). Lastly, the courts have ruled that a proper 103 rejection additionally requires the examiner to show (1) that the prior art would have suggested to those of ordinary skill in the art that they should make the claimed device, (2) that the prior art also would have revealed that in so making those of ordinary skill would have a reasonable expectation of success, and (3) that both the suggestion and the reasonable expectation of success are grounded in the prior art and not in the Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991).

With the rules from Graham, Gordon, and Vaeck in mind, Applicant makes the following general remarks about Applicant's specification. The Applicant's specification discusses the background of the invention from page 1, line 3 to page 5, line 2. In this discussion, Applicant discusses prior art display assemblies as shown in Figures 1A, 2A, 2B and 2C. Applicant also discusses "modifications which may be made to the display assembly of the prior art" (page 6, lines 21-22); however, the embodiments shown in Figures 3A, 3B, 4A, 4B, 5A and 5B are not admitted to be prior art or obvious to those skilled in the art. Applicant's characterization of the subject matter of Figures 3A, 3B, 4A, 4B, 5A and 5B as "modifications which may be made to the display assembly of the prior art" does not communicate that such modifications have, in fact, been made, or that they are taught by the prior art. The discussion related to Figures 3A, 3B, 4A, 4B, 5A and 5B is solely intended to point out that further modifications leading to the subject matter of the presently claimed invention would not have been obvious.

The object of the present invention is to provide a display assembly that includes two superposed display devices allowing an inversion of contrast of one of the displays without increasing energy requirement and without requiring a complex polarizer drive (present specification, page 5, lines 3-7). The presently claimed invention does not permit the presence of a

polarizer or any other structure between the display cell and the optical valve, and each of the independent claims 1, 13, 20 and 21 specifically recite that the "first contrast inversion device and the second contrast inversion display device are superposed."

Specifically, the instant specification defines that "[t]he actual construction of the two superposed display devices...corresponds to what was already described with reference to Fig 1A, with the exception of intermediate polariser 42 which has been omitted (page 7, lines 3-6, emphasis added)." All of the embodiments shown in Figures 6-10 show display cell (26) superposed on optical valve (28) with no polarizer disposed in between.

Applicant's use of the term "superpose" to describe the patentable relationship between the two contrast inversion display devices is adequately described in the instant specification on page 7, lines 3-6, and is consistent with the meaning of the word. Specifically, one definition of "superpose" is one upon another (Random House Webster's college dictionary, 1991, page 1341). The word "upon" communicates the positional relationship "in or into complete or approximate contact with" (Random House Webster's college dictionary, 1991, page 1456). In all of the prior art devices discussed in the present specification, a polarizer is disposed between the display cell and the optical valve. With this structure, it is not possible for the display cell to contact, or approximately contact, the optical valve because there is a barrier (i.e., the polarizer) in between. Therefore, given (a) the above definition of "superpose" provided by the Random House Webster's college dictionary (b) the definition of "superposed display devices" reasonably described in the specification (page 7, lines 3-6) and (c) as shown in Figures 6-10, it is clear that the phrase "two superposed contrast inversion display devices" recited in claims 1 and 13 does not allow for a polarizer to be interposed between the two contrast inversion display devices.

Thus, Applicant contends that the AAPA does not teach, or even suggest, "two superposed contrast inversion display devices" as recited in independent claims 1, 13, 20, 21, 27 and 28.

Applicant's Additional Arguments Regarding The Admitted Prior Art (AAPA)

All of the embodiments shown in Figures 1A, 2A, 2B, and 2C of the AAPA include a polariser (42) sandwiched between a display cell (26) and an optical valve (28). The display cell (26) and the optical valve (28) are of the positive anisotropy twisted nematic type (See instant specification, page 2, lines 30-31). Applicant contends that the AAPA does not teach, or even suggest, that "first contrast inversion device and the second contrast inversion display device are superposed," as recited in claims 1, 13, 20, 21, 27 and 28, because of the presence of the intervening polariser (42).

It is also noted that the AAPA teaches only two switching states for the display cell (26) and the optical valve (28), namely the OFF-OFF state and the ON-ON state (See instant specification, page 3, lines 20-32). The AAPA does not teach, or even suggest, switching the display cell (26) and the optical valve (28) to achieve contrast inversion. Consequently, the AAPA does not teach, or even suggest, "two superposed contrast inversion devices" as recited in claims 1, 13, 20, 21, 27 and 28.

Furthermore, the Examiner has admitted that the AAPA does not teach, or even suggest, that (a) "when the display cell is switched to display at least one item of data...the first display device has a dark shade and the back polariser is a reflective polariser" as recited in claims 1, 20 and 27, (b) "when the display cell is switched to display at least one item of data...the first display device has a light shade and the back polariser is an absorbent polariser" as recited in claims 13, 21 and 28, and (c) that "the transparent substrates opposite the display cell and the valve are combined in a single transparent substrate" as recited in claims 20 and 21 (Office Action dated December 3, 2003, page 4, lines 1-3, and page 6, lines 1-5).

Furthermore, the embodiments recited in claims 1 and 13 specify that the second active display includes only two polarisers, which is not taught, or even suggested, by the AAPA. In addition, Applicant contends that the AAPA does not teach the four "switching states" recited in each of claims 22-26.

Applicant's Arguments Regarding the Wang Patent

The Wang Patent discloses a sub-twisted nematic liquid crystal display (SBTN-LCD) in Figure 12 that is configured for transmissive mode operation (col. 5, lines 26-28). Specifically, the Wang Patent teaches that the SBTN-LCD has a double LCD configuration with sub-twisted nematic liquid crystals (SBTN). These SBTNs must have a twist angle of less than 90° (i.e., approximately between 46° and 89°, and preferably about 55°) so as to avoid the need for dopants (col. 3, lines 55-56, and col. 5, lines 51-60). Those skilled in the art would recognize that an SBTN acts as a retardation plate wherein $\Delta n \cdot d = \lambda/2$. On the other hand, as recited in claims 1, 13, 20 and 21, the liquid crystals used in the present invention are of the "twisted nematic" type. The present specification describes conventional twisted nematic liquid crystals for the display cell and the optical valve because a 90° rotation (i.e., twist angle) is described for these structures (See instant specification, page 7, line 34 to page 8, line 22). Those skilled in the art would know that twisted nematic liquid crystals do not function as a retardation plate; instead, they operate as a waveguide wherein $\Delta n \cdot d >>> \lambda/2$ (Mauguin's conditions).

Thus, the Wang Patent does not teach, or even suggest, "twisted nematic" liquid crystals such as are recited in claims 1, 13, 20 and 21 of the present invention. In fact, as discussed above, the Wang Patent expressly teaches away from the use of twisted nematic liquid crystals (See Wang Patent, col. 5, lines 51-60).

As shown in Figure 12 of the Wang Patent, the SBTN-LCD display includes two substantially identical liquid crystal layers (132), (134) separated by a control glass plate (135) and having "opposite sense of twist" (col. 12, lines 61-67). The device shown in Figure 12 of the Wang Patent operates in a "transmission mode" contrary to the devices shown in Figures 2, 10 and 11 and does not include the reflective layer (44), (84), (124) provided in the devices shown in Figures 2, 10 and 11, respectively. Consequently, the device shown in Figure 12 of the Wang Patent is not a "contrast inversion display device" as recited in claims 1, 13, 20, 21, 27 and 28 of the present invention because this device of the Wang Patent does not utilize light reflected from a

first display device. In addition, the polarizers (144) and (148) are both absorbent polarizers (col. 13, lines 21-32).

There is no teaching in the Wang Patent to suggest adding a back reflective element to the double LCD configuration shown in Figure 12. In fact, a person of skill in the art would realize that it would be ineffective and nonsensical to do so. On the other hand, the structure of the present invention as claimed in claims 1, 13, 20, 21, 27 and 28 uses two display devices in a coordinated manner to provide the rear portion of the display assembly (i.e., the first display device and back polarizer) with the properties of a reflective polarizer. More particularly, as recited in claim 1 of the present invention, when the first display device has a dark shade, a reflective back polarizer is used. When the first display device has a light shade, then an absorbent polarizer is used and the first display device serves as a reflective surface.

While the device shown in Figure 12 of the Wang Patent can operate in either a positive or a negative mode (col. 13, lines 7-32), these modes operate according to how light is transmitted along a single optical path through the liquid crystal layers and have nothing to do with contrast inversion. Illustrative examples of contrast inversion are shown by Figures 6B and 6D, 7B and 7D, 8B and 8D, 9B and 9D, and 10B and 10D of the present application. The subject matter pertaining to these contrast inversion switching modes is claimed in new claims 22-26. The Wang Patent simply does not teach, or even suggest, the subject matter in new claims 22-26, which includes four different switching modes in each of new claims 22-26.

The two modes described by the Wang Patent (col. 13, lines 15-31) permit either full transmission of light through the device shown in Figure 12, which would correspond to the field-off state where both SBTN layers are OFF-OFF, or the display of a piece of information as a dark symbol on a bright background, which would correspond to the field-on state where both SBTN layers are ON-ON. The Wang Patent does not teach, or even suggest, how to display a piece of information as a bright symbol on a dark background, as provided by the structure recited in claims 22-26. Furthermore, the Wang Patent does not teach, or even suggest, the four "switching

states" recited in claims 22-26, wherein two of the four switching states are contrast inversions of one another.

In summary, the Wang Patent does not teach, or even suggest, (a) "contrast inversion display devices" as recited in claims 1, 13, 20, 21, 27 and 28, and (b) "twisted nematic" liquid crystals as recited in claims 1, 13, 20 and 21. Furthermore, the Wang Patent does not teach that "the first display device has a dark shade and the back polariser is a reflective polarizer" as recited in claims 1, 20 and 27. Lastly, the Wang Patent does not teach, or even suggest, having four "switching states" that include two contrast inversion states as are recited in each of claims 22-26.

Applicant's Arguments Regarding The Masafumi et al. Reference

The Masafumi et al. reference discloses a "liquid crystal display" device comprising a first liquid crystal cell (16) and a second liquid crystal cell (18), made up of a liquid crystal layer sealed in a gap between a pair of transparent substrates having an electrode formed on each of the inner surfaces thereof, facing each other and disposed in that order from the visible side, with an absorption-type polarizing film (12) disposed on the visible side of the first liquid crystal cell (16) and a reflection-type polarizing film (14) disposed on a side of the second liquid crystal cell (18), see Abstract. The liquid crystal cells are preferably twisted nematic liquid crystals, and may have a twist angle of 90° (col. 3, lines 36-40, and col. 6, lines 18-20). However, the display device disclosed by Masafumi et al. does not teach, or even suggest a "display assembly with two superposed contrast inversion display devices" as recited in claims 1, 13, 20, 21, 27 and 28. In fact, the Masafumi et al. reference teaches that the first liquid crystal display cell (16) and the second liquid crystal cell (18) are disposed such that the display regions of the respective liquid crystal cells are "superimposed" on each other (col. 5, lines 6-10). As shown in Figure 1, these structures are not "superposed" cells in accordance with the present invention because there is nothing in the reference to teach, or even suggest, that they are in contact or in approximate contact with one another. As suggested by Figure 1, Masafumi et al. schematically illustrate that cells (16) and (18) are separated from each other and not in contact or in approximate contact.

In addition, the Masafumi et al. reference teaches that "a conventional liquid crystal display panel used in electronic equipment other than a timepiece" can include an "inverse mode" (col. 1, line 58, to col. 2, line 22) and describes the operation of the "inverse mode" that those skilled in the art would recognize as the "inverse addressing" referred to in the present specification (page 3, lines 20-27). In accordance with the discussion of inverse addressing in the present specification, Masafumi et al. also point out that the "inverse mode" is not suitable for portable devices such as timepieces. Consequently, the Masafumi et al. reference stands in support of the proposition that those skilled in the art would not apply inverse addressing to a timepiece.

Finally, Applicant contends that the Musafumi et al. reference does not teach, or even suggest, "two superimposed contrast inversion display devices" as recited in claims 1, 13, 20, 21, 27 and 28 of the present application. Furthermore, Applicant asserts that the Musafumi et al. reference does not teach, or even suggest, the four "switching modes" recited in each of claims 22-26 of the present application.

Combinations of the Prior Art

The AAPA teaches a display apparatus that includes a polariser sandwiched between a display cell and an optical valve. The display cell and the optical valve may be twisted nematic type liquid crystal cells of positive anisotropy. However, the AAPA does not teach " two superposed contrast inversion display devices." The AAPA also does not teach that a "first display has a dark shade and the back polariser is a reflective polariser." Furthermore, the AAPA teaches only an OFF-OFF switching state and an ON-ON switching state. The AAPA does not teach contrast inversion switching states, or having four switching states.

The Wang Patent teaches an SBTN-LCD display that includes a double LCD configuration wherein no polariser is located between two adjacent sub-twisted nematic liquid crystals. The double LCD configuration transmits light and is provided with two absorbent polarisers, but the double LCD configuration does not operate to provide contrast inversion. Therefore, the Wang Patent does not teach, or even suggest, "two superposed contrast inversion

display devices." The Wang Patent also does not teach that a "first display has a dark shade and the back polariser is a reflective polariser." Furthermore, the Wang Patent teaches only an OFF-OFF switching state and an ON-ON switching state. The Wang Patent does not teach contrast inversion switching states, or having four switching states.

The Musafumi et al. reference teaches a liquid crystal display that includes superimposed liquid crystal cells that are otherwise separated from one another. The two liquid crystal cells are therefore not "superposed" in accordance with the present invention. Furthermore, the Musafumi et al. reference teaches an "inverse mode" that those skilled in the art would recognize is inverse addressing. Inverse addressing is not contrast inversion and the Musafumi et al. reference explicitly teaches that the "inverse mode" is not suitable for use in portable timepieces. Thus, the Musafumi et al. reference doe not teach, or even suggest, "two superposed contrast inversion display devices." The Musafumi et al. reference also does not teach that a "first display has a dark shade and the back polariser is a reflective polariser." The Musafumi et al. reference also does not teach contrast inversion switching states, or having four switching states.

Application of the four prong test of Graham to the AAPA, the Wang Patent and the Musafumi et al. reference reveals that the scope and content of these three prior art references **fails to teach, or even suggest**, "two superposed contrast inversion display devices" as recited in claims 1, 13, 20, 21, 27 and 28; that the "first display has a dark shade and the back polariser is a reflective polariser" as recited in claims 1, 20 and 27; and the contrast inversion switching states or having four switching states as are recited in claims 22-26. Therefore, because the prior art fails to teach these features of the claims, no combination of the prior art of record can support a rejection under 35 U.S.C. § 103(a).

Claims 9 and 19

With respect to claims 9 and 19, the Examiner asserts that constructing a display assembly so that "the digital part of the first display device and the second display device have the same structure" would simplify manufacturing and, therefore, be obvious (Office Action dated

December 3, 2003, page 8, lines 16-21). However, the Examiner provides no teaching grounded in the prior art to support his conclusion. The Federal Circuit has ruled that the Administrative Procedures Act requires "reasoned decisionmaking" that is based on the evidence of record. In re Lee, 61 U.S.P.Q.2d 1430, 1433 (Fed. Cir. 2002). In this case, the Examiner has not provided evidence, in the form of a prior art reference or otherwise, to support his bare conclusion as to what would be obvious. Applicant demands that the Examiner either provide evidence, such as a prior art reference, to support his conclusion in accordance with Lee, 61 U.S.P.Q.2d at 1433, or withdraw his rejection of claims 9 and 19.

Conclusion

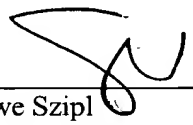
Applicant has shown that the Examiner's rejection under 35 U.S.C. 103 of claims 1-4, 8-16 and 18-28 is untenable and should be withdrawn because all combinations of the Applicant's Admitted Prior Art, the Wang Patent, and the Musafumi et al. reference would still fail to teach, or even suggest, "two superposed contrast inversion display devices" as recited in claims 1, 13, 20, 27 and 28; that the "first display has a dark shade and the back polariser is a reflective polariser" as recited in claims 1, 20 and 27; and having four switching states, including two contrast inversion switching states, as are recited in claims 22-26.

For all of the above reasons, claims 1-4, 8-16 and 19-28 are in condition for allowance and a prompt notice of allowance is earnestly solicited.

Questions are welcomed by the below signed attorney of record for the Applicant.

Respectfully submitted,

GRIFFIN & SZIPL, PC



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